International Journal of Clinical and Diagnostic Pathology

ISSN (P): 2617-7226
ISSN (E): 2617-7234
www.patholjournal.com
2020; 3(3): 39-42
Received: 25-05-2020
Accepted: 27-06-2020

Dr. Anuja Dasgupta
Assistant Professor, Department of Pathology, Akash Institute of Medical Sciences and Research Centre, Devanahalli, Bengaluru, Karnataka, India

Dr. Supriya Sandeepa
Professor, Department of Pathology, Akash Institute of Medical Sciences and Research Centre, Devanahalli, Bengaluru, Karnataka, India

Dr. Uma K
Assistant Professor, Department of Pathology, Akash Institute of Medical Sciences and Research Centre, Devanahalli, Bengaluru, Karnataka, India

Dr. Subhashini R
Tutor, Department of Pathology, Akash Institute of Medical Sciences and Research Centre, Devanahalli, Bengaluru, Karnataka, India

Corresponding Author:
Dr. Anuja Dasgupta
Assistant Professor, Department of Pathology, Akash Institute of Medical Sciences and Research Centre, Devanahalli, Bengaluru, Karnataka, India

Study on the patterns of semen analysis in infertile males at a tertiary setup in Devanahalli

Dr. Anuja Dasgupta, Dr. Supriya Sandeepa, Dr. Uma K and Dr. Subhashini R

DOI: https://doi.org/10.33545/pathol.2020.v3.i3a.258

Abstract
Background: Infertility is a stigma in our social environment where 40-50% is due to male infertility.
Aim: To evaluate the different patterns of semen abnormalities seen with associated factors.
Methods: A prospective study was carried out at the Pathology Laboratory on seminal fluid with male factor as the cause for infertility. Semen samples were analyzed by manual method, using WHO guidelines.
Result: Out of 110 samples studied, 74 were Normozoospermia with normal semen parameters and 36 had abnormal semen parameters. Oligoasthenozoospermia was more evident (23), followed by Oligozoospermia (7), Asthenozoospermia (3), Azoospermia (2) and Teratozoospermia (1).
Conclusion: Semen analysis remains the cornerstone for evaluating infertility in males. More than the seminal volume given importance; the count, motility and morphology are the most valuable factors of male infertility. Negative lifestyle has a significant impact on semen parameters especially with cigarette smoking and to some extent alcohol consumption.

Keywords: Male infertility, semen analysis, oligoasthenozoospermia, smoking

Introduction
In 1677, a firm evidence of the contribution of the sperm to reproduction came when Leeuwenhoek, on examining his own ejaculate, saw under the microscope live human sperm cells in a drop of semen for the first time [1].
Infertility has been an on-going concern through the ages and still remains a major clinical problem today, affecting affects 15-20% of couples [2, 3]. Male infertility accounts for 40-50% of infertility, affecting 7% of all men. (4) In India, the prevalence of primary infertility has been estimated to be 10-20% [5]. A study in North India revealed no change in the quality whereas another study in South India showed a decline in the quality of semen [6, 7]
Infertility is typically defined as failure to conceive after at least one year of regular, unprotected sex [3].
In the past major focus of infertility problems has been on female patients [8]. Now recently discovered that infertility is a prevalent condition affecting an estimated 70 million people globally [9]. It is a condition with combined factors of psychological, economic and medical resulting in trauma, marital stress, particularly in a social set-up like ours, with a strong emphasis on child-bearing [1]. Modern lifestyle and urbanization are few of the factors responsible for male infertility [10].
Semen analysis, being a very simple and fundamental test, remains the key investigation to study the impact of these factors in cases of male infertility. The pathological causes for decreased sperm count arise from defect in the control mechanism of production of sperm cells at pre-testicular, testicular or post testicular level [11].
The commonest factor responsible for male infertility are smoking, alcohol, pollution, stress, body mass index, diabetes, surgery, post pubertal mumps viral and veneral diseases [2, 8, 11]. It is likely that smoking adversely affects male reproductive health [1]. Stress and excessive exercise are also factors that can effect sperm parameter [7].
Infertility can be divided into primary infertility and secondary infertility. Primary infertility is when the man has never impregnated a woman. Secondary infertility applies when the man has some time impregnated a woman, even if the woman is not the partner in the present couple. The male infertility can possibly be due to reduced number of spermatozoa

(oligozoospermia), reduced sperm motility (asthenozoospermia), reduced sperm vitality (necrozoospermia), abnormal sperm morphology (teratozoospermia) or any combination of these [12].

The objective of this study was to evaluate the patterns of semen abnormalities in couples with male factor infertility so that the most common abnormalities of the semen parameters are determined.

Materials and Methods

This is a retrospective study wherein semen analyses of all the patients who presented at Akash Institute of Medical Sciences and Research Centre, Devanahalli, with male factor alone as the cause for infertility, from 1 October 2018 to 30 September 2019.

Semen collection was done at the hospital in sterile plastic containers by masturbation after 3 days of abstinence. Samples were delivered within one hour of collection and analyzed by manual method for volume, viscosity, sperm concentration, motility, and morphology. The following criteria were used for the interpretation of results: Volume: 1.5 mL, Sperm concentration: 15 million spermatozoa/mL, Morphology: 4% normal forms, Progressive motility: 32%, Total (progressive+ non-progressive motility): 40% [13].

Inclusion criteria

1. Couples married for atleast 12 months having regular unprotected intercourse

Exclusion criteria

1. Couples with female factor infertility

Result

The present study was conducted to determine the abnormalities in semen samples of male infertility. Of the total 110 semen samples studied, majority of them were in the age group of 20-35 years (80%) and the remaining (20%) were in the age group of 36-50 years (Fig 1).

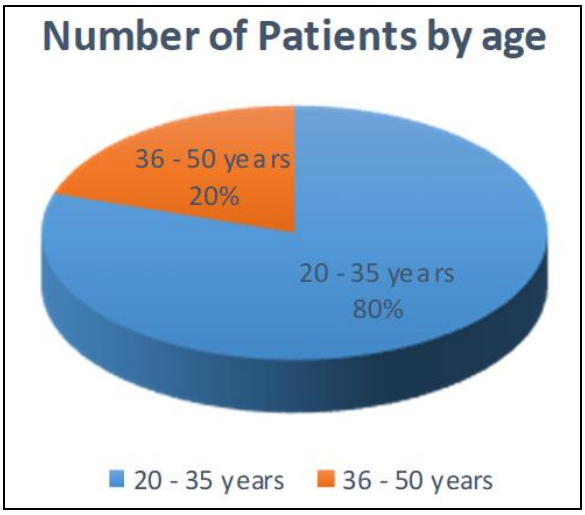

Fig 1: Number of Patients by Age

47% were smokers, 13% were alcoholic, 2% being both smoker and alcoholic and 1% being addicted to tobacco chewing.

Out of the 110 samples being analyzed, 36 (33%) were abnormal. These were further analyzed and showed 21% of Oligoasthenozoospermia, 6% Oligozoospermia, 3% Asthenozoospermia, 2% Azoospermia and 1% of Teratozoospermia (Table 1, Fig 2).

Table 1: Distribution of the Cases According to Semen Analysis

Sl. No	Distribution of Cases	Total and Percentage	
1	Normozoospermia	74	(67%)
2	Oligoasthenozoospermia	23	(21%)
3	Oligozoospermia	7	(6%)
4	Asthenozoospermia	3	(3%)
5	Azoospermia	2	(2%)
6	Teratozoospermia	1	(1%)
	Total	110	(100%)

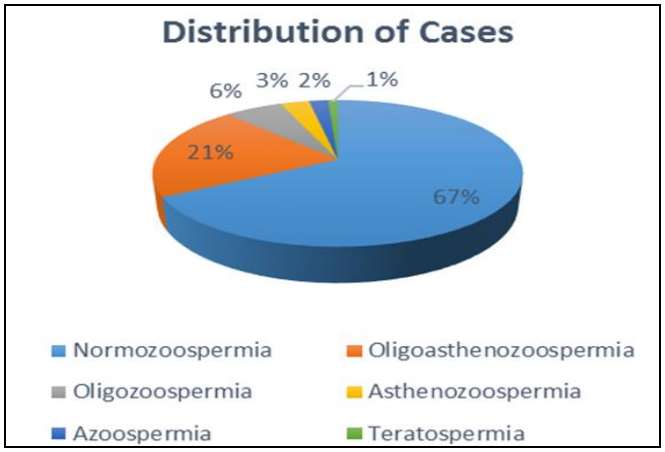

Fig 2: Distribution of the Cases According to Semen Analysis

In our study 3% had volume < 1.5ml and 3% had liquefaction > 30 minutes. (Table 2)

Table 2: Volume, pH and liquefaction abnormalities in semen analysis

Parameters	No. of Patients	Percentage
Volume		
≥1.5ml	102	92%
< 1.5ml	8	7%
pH		
Normal	109	99%
< 7	1	1%
Liquefaction		
Within 30 minutes	107	97%
> 30 minutes	3	3%

Discussion

For infertility females were always accused, but with the advancing knowledge it has been proven that males are equally involved in this problem. This causes a great stress to the couples as well as to the society we live in with a strong emphasis on child-bearing. Semen analysis remains the fundamental of the laboratory evaluation for assessing the quality of semen in infertile males.

In the present study, 80% of the patients were in the age group of 20-35 years. This was similar to other studies done by Shaikh AH [8] and Joshi P [11] with 82%and 72% respectively. The effect of women's age on fertility is well recognized, whereas in men's age, it remains uncertain [11] although a study done by Merino G *et al.*, concluded that age contributed to a decline in sperm motility and morphology in men over age of 40 years [14]

In a study by Tawadrous GA *et al.*, [15] 2011, reported that infertile men, particularly smokers, have significantly lower semen variables and significantly higher sperm apoptic markers. Therefore men should be counseled and encouraged to stop smoking especially while trying to conceive. Excessive alcohol consumption has been associated with poor reproductive function. In our study 47% were smokers, 13% were alcoholic, 2% being both smoker and alcoholic and 1% being addicted to tobacco chewing. This was similar to the other studies by Shaikh AH [8] and Joshi P [11] where 58%, 6%, 6% and 44%, 16%, 9% in smokers, alcoholics and in combination of these addictions respectively. Alcohol has profound effects on Leydig cell function by reducing the testosterone synthesis and its metabolite, acetaldehyde, leading to membrane damage and the formation of Leydig cell autoantibodies [5].

The most common abnormalities of semen analysis in this study were Oligoasthenozoospermia (21%), followed by Oligozoospermia (6%), Asthenozoospermia (3%), Azoospermia (2%) and Teratozoospermia (1%). Oligoasthenozoospermia was reported in studies by Aulia *et al.* [2] and Milardi *et al.* [16] with 17.8% and 12.1% respectively, although it was not the most common in their studies. In the report by Chukwunyere *et al.* [17] showed oligospermia being the most common (28%) contributor to abnormal semen quality in 212 subjects. A study done by Adenji *et al.* [18] reported asthenozoospermia being the most common (27.8%) of the disorders in 824 male partners. Another study done by AlEnezi *et al.* [19] observed that nearly half of the samples studied were teratozospermia. Conflicting results from different studies may be influenced by many factors and several studies have analyzed the influence of environmental to semen quality [20].

Conclusion

Semen analysis remains the basic laboratory study in the investigation of male infertility which helps to provide information about abnormalities of sperm count, motility and morphology. The present study revealed that majority of the cases of infertility in males is oligoasthenozoospermia followed by oligozoospermia. In conclusion, our results suggest that more than the seminal volume, the count, motility and morphology are the important factors in the etiology of male infertility. Negative lifestyle has a significant impact on semen parameters especially with cigarette smoking and to some extent alcohol consumption. Males should be advised and encouraged to come earlier for semen investigations.

Acknowledgements

I would like to thank my teaching staff of Department of Pathology, AIMS&RC and the technicians of Haematology Central Lab, Akash Hospital, who had directly or indirectly contributed to the completion of the study.

Reference

1. Jain A, Ambrish PI, Hoogar MB, Dhar R, Wani A, Agrwal S. Role of semen analysis in the diagnosis of infertility at a tertiary care centre in Western India: a prospective study. Int J Reprod Contracept Obstet Gynecol. 2017; 5(7):2389-91.
2. Aulia SN, Lestari SW, Pratama G, Harzief AK, Sumapraja K, Hestiantoro A, Wiweko B. The pattern of abnormalities on sperm analysis: A study of 1186 infertile male in Yasmin IVF clinic Jakarta. InJournal of Physics: Conference Series. 2017; 884(1):012-138). IOP Publishing.
3. Katz DJ, Teloken P, Shoshany O. Male infertility-The other side of the equation. Australian family physician. 2017; 46(9):641.
4. Jajoo S, Kalyani K. Prevalence of abnormal semen analysis in patients of infertility at a rural setup in Central India. Int J Reprod Contracept Obstet Gynecol. 2013; 2(2):161-4.
5. Kumar N, Singh AK. Trends of male factor infertility, an important cause of infertility: A review of literature. Journal of human reproductive sciences. 2015; 8(4):191.
6. Marimuthu P, Kapilashrami MC, Misro MM, Singh G. Evaluation of trend in semen analysis for 11 years in subjects attending a fertility clinic in India. Asian J Androl. 2003; 5:221-5.
7. Adiga SK, Jayaraman V, Kalthur G, Upadhya D, Kumar P. Declining semen quality among south Indian infertile men: A retrospective study. Journal of human reproductive sciences. 2008; 1(1):15.
8. Shaikh AH, Khalique K, Tanq G, Soomro N. Pattern of semen abnormalities in couples with male factor infertility. Pak J Surg. 2011; 27(3):204-8.
9. Fainberg J, Kashanian JA. Recent advances in understanding and managing male infertility. F1000 Research, 2019, 8.
10. Choksi T, Patel A, Shrivastav A, Agnihotri AS. Semen analysis: Study of hundred samples of semen, in association with different epidemiological parameters, from cases of male infertility. Journal of research in medical and dental science. 2015; 3(3):232-4.
11. Joshi P, Gopal N, Bhat V. Study of semen analysis patterns in infertile males. International journal of pharmacy and biological sciences. 2011; 1(1):44-9.
12. Sharma A. Male infertility; evidences, risk factors, causes, diagnosis and management in human. Annals of Clinical and Laboratory Research. 2017; 5(3):188.
13. Cooper TG, Noonan E, Von Eckardstein S, Auger J, Baker HW, Behre HM, Haugen TB, Kruger T, Wang C, Mbizvo MT, Vogelsong KM. World Health Organization reference values for human semen characteristics. Human reproduction update. 2010; 16(3):231-45.
14. Merino G, Carranza-Lira S. Semen characteristics, endocrine profiles, and testicular biopsies of infertile men of different ages. Archives of andrology. 1995; 35(3):219-24.
15. Tawadrous GA, Aziz AA, Mostafa T. Effect of smoking status on seminal parameters and apoptotic markers in infertile men. The Journal of urology. 2011; 186(5):1986-90.
16. Milardi D, Grande G, Sacchini D, Astorri AL, Pompa G, Giampietro A, De Marinis L *et al*. Male fertility and reduction in semen parameters: a single tertiary-care center experience. International journal of endocrinology, 2012.
17. Chukwunyere CF, Awonuga DO, Ogo CN, Nwadike V, Chukwunyere KE. Patterns of seminal fluid analysis in male partners of infertile couples attending gynaecology clinic at federal medical centre, abeokuta. Nigerian

journal of medicine: journal of the National Association of Resident Doctors of Nigeria. 2015; 24(2):131-6.
18. Adeniji RA, Olayemi O, Okunlola MA, Aimakhu CO. Pattern of semen analysis of male partners of infertile couples at the University College Hospital, Ibadan. West African journal of medicine. 2003; 22(3):243-5.
19. AlEnezi H, Isa AM, Abu-Rafea B, Madbouly K, Binsaleh S. Pattern of semen fluid abnormalities in male partners of infertile couples in Riyadh, Saudi Arabia. Can J Urol. 2014; 21(3):7322-5.
20. Santi D, Vezzani S, Granata AR, Roli L, De Santis MC, Ongaro C *et al*. Sperm quality and environment: A retrospective, cohort study in a Northern Province of Italy. Environmental research. 2016; 150:144-53.